Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Rural Digital Opportunity Fund	)	WC Docket No. 19-126
	)	
Connect America Fund	)	WC Docket No. 10-90

COMMENTS OF CONEXON, LLC

Jonathan Chambers
Conexon, LLC
Partner
2001 Grand Blvd., Ste. 700
Kansas City, MO 64108
Phone: (202) 798-3884

September 20, 2019

TABLE OF CONTENTS

SUMMARY

A decade ago, the FCC set a course to put rural America at a long-term disadvantage to the rest of the country. At a time when the FCC projected that the vast majority of urban and suburban homes would have access to broadband at 100 Mbps speeds, the FCC established programs to limit rural broadband to 4/1 Mbps. At a time when the telecommunications and cable industries were deploying 1 Gbps to over 100 million households, the FCC incrementally adjusted these programs to 10/1 Mbps. Since the FCC established the Connect America Fund, it has committed tens of billions of dollars of the public's money mainly to require modest upgrades to incumbent telephone networks to make 4/1, 10/1 and 25/3 Mbps service available. The Connect America Fund Phase II auction was a partial break from the past, but one in which the FCC continued to reward subpar services in rural and high cost areas.

The Rural Digital Opportunity Fund is a true opportunity for rural America. It is also an opportunity for the Commission to begin to redeem itself for past mistakes. With one modification to the proposed rules, the Commission can better meet its requirements under Section 254 of the Communications Act. The Commission should amend its auction rules to award funds to the highest tier bidder in each geographic area eligible for auction, provided the total amount awarded is within the RDOF budget. By declaring that the highest tier bidder wins at the clearing round price, the Commission will make the most efficient use of the budget, cover a greater number of locations and, most important, more closely adhere to the Communications Act's mandate of service availability in rural, high cost and insular areas that is reasonably comparable to the services available to those living in urban areas.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Rural Digital Opportunity Fund	)	WC Docket No. 19-126
	)	
Connect America Fund	)	WC Docket No. 10-90

COMMENTS OF CONEXON, LLC

Conexon, LLC, a member of the Rural Electric Cooperative Consortium ("RECC"), a consortium that included nearly two dozen electric membership cooperatives that participated in the Connect America Fund Phase II ("CAF II") auction and intend to participate in the upcoming Rural Digital Opportunity Fund ("RDOF") auction, hereby submits the following comments in response to the Commission's proposals in its Notice of Proposed Rulemaking ("NPRM") in the above-captioned proceeding. Conexon's comments focus on two fundamental components of the RDOF auction scoring system that should be modified in advance of the RDOF auction if the Commission wishes to act in the best interests of the residents and businesses in rural communities.

First, as discussed in more detail below, at the RDOF auction clearing round, the Commission should award each geographic area to the bidder offering the highest level of service in that area, as determined by the least weight. The remaining bidding rounds should only continue between those bidders in the same geographic area at the same bidding weight.

Second, the reliability of rural broadband infrastructure should not be sacrificed to the interests of bidders who choose not to protect their services from interference. Services using licensed versus secondary, shared and/or unlicensed spectrum should be accorded different weights – whereby spectrum licensees are favored over those using relying upon secondary, shared and/or unlicensed spectrum to satisfy their RDOF performance requirements.

I. The Commission Should Employ a Two-Stage RDOF Auction to Initially Ensure that There is a Sufficient Budget to Cover All Bids and then to Award Funding to the Highest Performance Tier Bidder in each Geographic Area

For both the CAF II and the RDOF auction, there are two distinct stages to the auction design: pre- and post-clearing rounds. Prior to the clearing round, the Commission's auction design enables bidders to compete against each other: (1) across the country even though cost characteristics due to terrain and population density differ; and (2) between technologies that differ in capabilities.

To accomplish the first objective in the pre-clearing round, the Commission uses the Connect America Cost Model (CACM or CAM), which projects the costs of constructing, operating and maintaining a GPON fiber-to-the-home network to every census block in the country. The annual subsidy for high cost areas became the reserve price in the Rural Broadband Experiments, the CAF II auction, and now the RDOF auction. This process normalizes all parts of the country and thereby allows bidders wishing to serve one part of the country to bid against those wishing to serve any other part of the country.

To accomplish its second objective of allowing providers of different technologies to bid against each other, the FCC established performance tiers and weighted different services

according to speed, capacity, and latency. During the post-clearing rounds, the FCC does not permit any bidder to change bids by geography and bidding weights are used to pit bidders in the same geography against each other until one bidder remains.

Years of work by the Commission staff, the telecommunications industry and one of the nation's premier cost modelers produced multiple iterations of the FCC cost model. The CAM and its close cousin, the Alternative Connect America Cost Model ("ACAM"), have been used over the past five years as the basis for tens of billions of dollars of public spending directed by the FCC for rural broadband.

Conexon mentions these cost models to highlight the vast difference between the work and expertise that went into the development of the reserve prices and the lack of any similar work or even data undertaken by the Commission into the development of the weights and performance tiers governing the CAF II and the upcoming RDOF auctions. Yet, the bidding weights have a far more profound effect on the future of rural America. It is these bidding weights, at the clearing round and afterwards, that deserve the most attention in this rulemaking proceeding.

To put it differently, years of time, effort and public funding were spent to develop a highly detailed cost model for a GPON, fiber-to-the-home network. That model used cost data from major telecommunications companies, takes into account terrain and density, uses data on maintenance and the life of equipment, as well as the location of millions of homes and small businesses. The cost model determines the subsidy necessary. And, that cost modeling process is currently being used to fund tens of billions of dollars in rural broadband.

Whether or not one agrees with the model's precision, the cost model produces a thorough, highly detailed and vetted set of data. In contrast, with regard to bidding weights, the Commission appears to have taken a coin flip approach.

To understand how auction bidding weights were developed, one must understand the auction design theory of the Commission's economists and Rural Broadband Auctions Task Force. Certain FCC staff believed that the lowest tier bidder must be able to bid against the highest tier bidder at the outset of the auction. Thus, in a 100-point clock auction of the type used in CAF II, the maximum difference between the bottom tier and the top tier could be no more than 90 points. In the CAF II auction, 90 points was the difference between a high latency, 10/1 Mbps tier bidder and a Gigabit tier bidder. Similarly, under the Commission's RDOF proposal, there would be a 90-point difference between a high latency, 25/3 Mbps tier bidder and a Gigabit tier bidder. Under the Commission's RDOF proposal, once 40 points of weight is accorded to high latency services, 50 points remain, which is then divided evenly between the speed tiers. However, the Commission offers no rationale for proposing a 25-point difference between tiers.

In such a weighting system, 25 Mbps service will sometimes win out over 100 Mbps service or Gigabit service and 100 Mbps will sometimes win out over Gigabit service. But the Commission offers no rationale for electing to subsidize 25 Mbps service when Gigabit-tier service could be available and is within the RDOF budget. Nor does the Commission attempt to use data to demonstrate that 25 points is the correct value to place on such a consequential weighting system.

Does auction design require no more than a 90-point difference total between the lowest performance tier and the highest? Of course not. In fact, the data from the CAF II auction demonstrates that the 90-point difference between the high latency, 10/1 Mbps bidders and the low latency, Gigabit bidders had absolutely no impact on the auction. The clearing round in CAF II occurred at the 70% clock percentage by which time no 90-point weight bids remained.

Had the weights between the above baseline tier and the Gigabit tier in CAF II been 50 points instead of 15 points, the maximum spread would have been 125 instead of 90. The auction results would likely have differed only in that there would have been more Gigabit service awarded, but there would have been no change in the number of bidders who won at the 10/1 Mbps, high latency tier. The number of such winning bidders would have been zero in both cases.

During the CAF II auction, the Commission was willing to trade off the long-term interests of rural America for 15 points of weight, or 15% of a reserve price. Now, the Commission appears willing to make that trade-off for 25 points of weight. The results of the CAF II auction demonstrate that there are areas of the country that would have won fiber-to-the-home service, but bidders dropped out after the clearing round and now the areas will receive an inferior level of service for the next decade or longer.

At best, by evenly dividing bidding weights between the tiers, the Commission's proposed weighting system in the RDOF auction is an expression of uncertainty by the Commission. Since the FCC uses no data to inform the weighting decisions regarding what rural

communities and consumers prefer, those weights should only be used to assist in the auction to determine budget sufficiency. Then, at the clearing round, the equities should shift from whether there is a sufficient budget to determining the best service available within the budget.

After the clearing round, the bidding between performance tiers should largely cease and not be used to determine whether a rural community gets 25 Mbps, 100 Mbps or 1 Gbps service. Instead, at that point, the Commission should award each geographic area to the bidder proposing the highest performance tier and the lowest weight in each geographic area. The only geographic areas that would remain in the auction after the clearing round would be the areas where there are two or more bidders with the same highest tier/lowest weight and the auction would continue between and among only those bidders. All other bidders would be dropped.

It is impossible to determine the appropriate weights with reasonable certitude. Without using data on consumer preferences, any of the commenters' weighting proposals will likely be as arbitrary as the Commission's proposal. However, the Commission has access to hundreds of millions of data points about consumer choices in the 477 data and has run regression analyses on consumer preferences. Yet, the Commission elects not to use the data nor make it publicly available.

As a result, the Commission should follow the only approach that is knowable. If the total bidding meets the RDOF budget, availability of Gigabit service should be preferable to 100 Mbps service, which should be preferable to 25 Mbps service. In addition, low latency should be preferable to high latency. In the provision of wireless services, services protected from

interference with spectrum licenses should be preferable to services using secondary, shared and/or unlicensed spectrum and subject to interference. The Commission should follow those preferences in making the awards at the clearing round price.

This approach is more consistent with the law, economics, and the expressed preferences of rural communities. By awarding a greater number of winning bids at the clearing round price, the Commission will make the most efficient use of the budget, cover a greater number of locations and, most important, more closely adhere to the Communications Act's mandate of service availability in rural, high cost and insular areas that are reasonably comparable to the services available to those living in urban areas.

Section 254 of the Communications Act language requires that the Commission ensure that:

> Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas.

According to the National Cable and Telecommunications Association, Gigabit services are now available to 80% of all households in the country, which means that Gigabit services are now or will soon be available to well over 90% of households in urban areas.[1] When the FCC examines the 477 data from its most recent data collection, it will find that the vast majority of urban areas now have Gigabit services available.

[1] *See* https://www.ncta.com/industry-data/80-of-us-homes-have-access-cables-gigabit-internet-speeds (stating 80% of U.S. homes have access to cable's gigabit internet speeds).

In 2019, comparable means the availability of Gigabit service. By 2030, while RDOF funding is still being provided, 25/3 Mbps and 100 Mbps will be wholly insufficient and not reasonably comparable, and 10 Gbps is more likely to become the benchmark for comparability.

The Commission should support inferior broadband service only when the option for Gigabit service is not available. For example, if an area of the country receives no bids at the Gigabit tier, then the Commission would properly award funds to a bidder that would provide 100 Mbps or 25 Mbps in order to ensure reasonable comparability to urban areas. For example, an area with a Gigabit tier bidder, which also contains a 25/3 Mbps tier bidder would be awarded to the Gigabit tier bidder. To continue the auction in that area would result in one of two sub-optimal outcomes. Either the 25/3 Mbps tier bidder wins relegating the rural area to an inferior service, or the Gigabit tier bidder will win with less funding than was planned in the budget. The Commission has already determined that 100% of the funding was necessary under the CAM, so an outcome that reduces funding well below the budget risks violating a second part of the Commission's mandate, which is to ensure reasonably comparable services available "at rates that are reasonably comparable to rates charged for similar services in urban areas."[2]

Conexon suggests that the Commission's objective of the auction is to determine which services should be subsidized *within the budget*, not at the least possible cost. In fact, that is the way a different part of the auction is structured. At each round, the auction software calculates

[2] 47 U.S.C. § 254(b)(3).

the amount necessary to fund the highest performance tier bidder (*i.e.,* the lowest weight). The clearing round occurs when there is sufficient budget to fund every one of the highest tier bidders in every geographic area remaining. Then, a plus up occurs at the clearing round.

During the CAF auction, the clearing round occurred when the clock reached 70%. At that point, there was more budget than bids, so the auction software calculated the amount of additional budget that could be spent and each bidder that was the sole bidder left in an area was awarded 78.35%. Where there was a bidder in a CBG at 70% and other bidders between 70 and 79%, the 70% bidder won at the lower of 78.35% and the other bidder's bid.

Instead of increasing the clearing round price, awarding a greater number of winning bids at the clock percentage is a more efficient use of the budget. In so doing, the auction will both cover a greater number of locations and achieve the highest level of service available in each geographic area. Such an approach will result in the highest levels of service to rural America, yet require no more funding than the current proposal and will be within the budget determined by the Commission.

II. The RDOF Auction Rules Should Favor Licensed Spectrum Holders over Entities that Rely Upon Secondary, Shared and/or Unlicensed Spectrum to Serve Rural Communities

In reviewing the bidder qualifications for the wireless bidders in the CAF II auction, with very few exceptions, the intention of the wireless bidders is to provide service using unlicensed spectrum. Bidder after bidder declared that they did not hold any spectrum license for the delivery of internet service to homes and businesses in any of the areas where they were placing bids. This point bears repeating. Most wireless bidders in the CAF II auction held no

spectrum licenses for the provision of Broadband Internet Access Service ("BIAS") in the areas they sought to serve. Instead, the bidders typically offered a laundry list of unlicensed spectrum bands (*e.g.*, 3.5 GHz (CBRS), 2.4 GHz, 2.5 GHz (EBS), 5 GHz, TVWS) as if the incantation of spectrum bands is the same as the ability to use those spectrum bands to actually deliver 100 Mbps BIAS.

The largest winning wireless bidders in the CAF II auction don't even advertise the availability of the service they committed to in their bids and have no realistic way of knowing whether they can meet their CAF II universal service requirements with unlicensed spectrum at those speed tiers. This is because it is the nature of unlicensed spectrum that no service has protection against interference by any other user of the bands.

The 2.4 GHz and 5 GHz spectrum bands have long been the most heavily trafficked unlicensed bands for uses as diverse as WiFi, baby monitors, cordless phones, garage door openers, and video doorbells. Even if wireless bidders could deliver 100 Mbps to rural customers by placing fiber close enough to every home, they cannot protect against interference and so cannot guarantee that they will fulfill their obligations. Only primary use spectrum licensees have such protection.

The unreliability of secondary, shared and unlicensed spectrum warrants a significant scoring difference between primary use licensed and secondary, shared and unlicensed wireless bidders. As illustrated in the table below, the applied weight to secondary, shared and unlicensed wireless bidders should be similar to the weight accorded high latency bidders:

Symmetrical Speed	Requirement	Weight
Licensed Spectrum	Licensee has primary use rights in specified bands over RDOF winning area	0
Secondary, Shared and/or Unlicensed Spectrum	Secondary, shared and/or unlicensed spectrum to be used for connections to RDOF-eligible locations	40

The largest fixed wireless provider in the country, Rise Broadband, was the first recipient of support from the Connect America Fund. Yet, it does not it maintain that it can provide 100 Mbps broadband service with its fixed wireless platform. On its website, it acknowledges a limitation of service availability that states:

> Service Availability – The Service is subject to availability as it is contingent on available RISE facilities and unique signal path conditions between such facilities and the USER premises. Due to the nature of the Service technology, RISE reserves the right to deem the Service unavailable to the USER up to, including, and after the installation. RISE assumes no liability whatsoever for any claims, damages, losses or expenses arising out of or otherwise relating to the unavailability of the Service in USER's geographical area, for any reason, even where such unavailability occurs after installation of the Service.[3]

Rise Broadband's disclaimer is appropriate and commonplace for a wireless bidder using unlicensed spectrum. However, such a service disclaimer regarding an entity's provision of broadband service is not appropriate when meeting universal service obligations that are supported by public funds.

[3] *See* https://www.risebroadband.com/legal/broadband-internet-terms-and-conditions-of-service/ ("Service Characteristics").

In the Mobility Fund Phase I auction, the Commission limited bidders to those who hold licenses or those who have entered into long-term spectrum leases with a licensee.[4] While the same restriction to licensed spectrum may not be appropriate for the RDOF auction, broadband services that depend upon secondary, shared and/or unlicensed spectrum are unprotected from interference and, therefore, inherently less reliable. As a result, the Commission should place additional scoring weight on bidders in the RDOF auction proposing to use secondary, shared and/or unlicensed spectrum.

The choice of whether to ensure protection against interference or not is entirely within the control of the wireless service provider. Those who do not hold licenses today are certainly aware that they have an opportunity to participate in the CBRS auction next June. If such bidders choose not to participate in the CBRS auction, or do not have the financial wherewithal to be successful in the CBRS auction, rural America should not have to suffer the consequences.

III. Conclusion

Chapter 8 of the National Broadband Plan set out a 2020 goal for rural America: 4 Mbps download, 1 Mbps upload.[5] For nearly a decade, the FCC, the expert agency of the federal government charged with ensuring access to telecommunications and information services to all Americans, has pursued incrementalist policies that never allow rural America to catch up

[4] *See* Mobility Fund Phase I Auction Scheduled for September 27, 2012, Notice and Filing Requirements and Other Procedures for Auction 901, 27 FCC Rcd 4725, 4751 ¶ 83 (2012) ("Each applicant will also be required to provide a general narrative description of its access to the spectrum it plans to use to meet Mobility Fund obligations in the particular area(s) for which it plans to bid and certify that it will retain its access to the spectrum for at least five years from the date of award of support."); *Id.* at 4754 ¶ 96 ("…[O]nly assured access is sufficient, which means that the access must be to licensed spectrum subject to limited access.").

[5] *See* https://transition.fcc.gov/national-broadband-plan/national-broadband-plan.pdf, p. 135.

with the rest of the country. The reasons are manifold: regulatory capture, missed signals on the growth of the internet, significant budgeting and modeling errors, and the soft bigotry of low expectations.

By 3031, a time when the RDOF monies will still be spent, 10 Gbps will be available to the vast majority of Americans. The Commission should not repeat the mistakes of the National Broadband Plan in *underestimating* the growth of the internet and overestimating the cost of building fiber networks. By its past incrementalist approach, the federal government has already spent more money on rural broadband than would have been necessary to build fiber optic networks to every rural home and business in the country.

Conexon's request to the Commission is simple and achievable: within the budget already established for the RDOF auction, award funding to the highest tier bidder in each geographic area. In short, at the auction clearing round, where there is a Gigabit tier bidder, Gigabit wins. Where there is no Gigabit tier bidder, 100 Mbps wins. And, only where there is no Gigabit or 100 Mbps tier bidder, the 25 Mbps tier bidder wins. With such an approach, rural America wins.

Respectfully submitted,

CONEXON, LLC

By: /s/

Jonathan Chambers
Partner
Conexon, LLC
2001 Grand Blvd., Ste. 700
Kansas City, MO 64108
Phone: (202) 798-3884

September 20, 2019